

CLAIMS:

1. A method of protecting a foot of a human from effects of a landmine explosion underneath said foot, including

5 guiding shock waves caused by the landmine explosion obliquely away from said foot by means of a correspondingly obliquely oriented shock wave guide member embedded in a sole volume of an article of footwear worn by the human, the shock wave guide member being of a material having an acoustic speed of at least more than 3000 m/sec;

10 cracking the material of the shock wave guide member by means of said shock waves at a speed of crack progression lower than the acoustic speed of said material of the shock wave guide member, and spalling said material at a downstream end of the shock wave guide member to create a path of lesser resistance for a blast following the shock waves;

15 causing said ensuing blast following the shock waves to follow said path of lesser resistance and removing said cracked material to render said path open;

deflecting any stray component of the shock waves back into the guide member and inhibiting propagation of any said stray component of the shock waves in a direction toward said foot in the sole volume of the article of footwear
20 by means of a layer of material having a low acoustic speed arranged between the shock wave guide member and an inner sole of the article of footwear.

2. A method as claimed in Claim 1 in which guiding the shock waves is obliquely laterally outwardly in accordance with an oblique outward orientation
25 of the shock wave guide member.

3. A method as claimed in Claim 1 or Claim 2 in which the shock wave guide member is selected to have an acoustic speed at least as high as the acoustic speed of glass.

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4. A method as claimed in any one of Claim 1 to Claim 3 inclusive which includes absorbing heat energy by evaporating liquid contained in the sole volume.

5 5. A method as claimed in Claim 4 in which the liquid is proximate the guide member.

6. A method as claimed in any one of Claim 1 to Claim 5 inclusive, in which said guiding of the shock waves, cracking of the shock wave material and
10 creating a path of lesser resistance take place in composite fashion along a plurality of paths alongside one another by means of a composite shock wave guide member having a plurality of shock wave guide elements alongside one another.

15 7. A method as claimed in Claim 6 in which each shock wave guide element is in the form of a strip of rigid glass containing material, the strips being oriented transversely to allow bending of the article of footwear along transverse bend lines intermediate adjacent strips.

20 8. A method as claimed in any one of Claim 1 to Claim 7 inclusive in which said layer of material having a low acoustic speed is in the form of vermiculite, or a composite material containing vermiculite.

9. A method as claimed in any one of Claim 1 to Claim 8 inclusive,
25 which includes enhancing shock wave progression downstream of the foot by means of a layer of soak-out material in close contact with skin along a foot surface opposite a sole of the foot, the layer of material having an acoustic speed at least equal to acoustic speed of flesh.

30 10. A method as claimed in Claim 9 in which the acoustic speed of said soak-out material is higher than the acoustic speed of water.

11. A method as claimed in Claim 9 or Claim 10 which includes containing the layer of soak-out material in association with a sock worn by the human.

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12. An article of protective footwear for a human having a composite sole including an outer sole along one extremity of the article of footwear, a spaced inner sole for seating a foot of a user, and a sole volume intermediate the outer and the inner soles, the composite sole including in said sole volume

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a shock wave guide member oriented to guide shock waves caused by a landmine explosion obliquely away from said foot in use, the shock wave guide member being of a material which has an acoustic speed at least higher than 3000 m/sec and which is prone to being cracked by shock waves at a speed of crack progression lower than its acoustic speed;

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a layer of blocking material having a low acoustic speed between the shock wave guide member and the inner sole.

13. An article of footwear as claimed in Claim 12 in which the shock wave guide member extends from a laterally inner position proximate the outer sole obliquely upwardly to a laterally outward extremity of the composite sole.

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14. An article of footwear as claimed in Claim 12 or Claim 13 in which the shock wave guide member is of solid material having an acoustic speed at least as high as the acoustic speed of glass.

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15. An article of footwear as claimed in Claim 14 in which the shock wave guide member is of, or contains, a material selected from glass and a ceramic material.

16. An article of footwear as claimed in any one of Claim 12 to Claim 15 inclusive in which the composite sole volume contains a liquid proximate the shock wave guide member.

5 17. An article of footwear as claimed in any one of Claim 12 to Claim 16 inclusive, in which the shock wave guide member is of composite structure comprising a plurality of shock wave guide elements extending alongside one another.

10 18. An article of footwear as claimed in Claim 17 in which each shock wave guide element is in the form of a strip of rigid material selected from glass or glass containing material, or a ceramic material, the strips being oriented transversely and arranged adjacent one another to allow bending of the article of footwear along transverse bend lines intermediate adjacent strips.

15 19. An article of footwear as claimed in any one of Claim 12 to Claim 18 inclusive in which the blocking material is vermiculite, or a composite material containing vermiculite.

20 20. An article of footwear as claimed in any one of Claim 12 to Claim 19 inclusive which includes a foot surrounding upper defining a foot cavity above the inner sole, and a layer of soak-out material in fluid form and having an acoustic speed equal to or higher than the acoustic speed of flesh and arranged to be in close contact with skin at a surface of the foot opposite a sole of the foot in use.

25 21. An article of footwear as claimed in Claim 20 in which the soak-out material has an acoustic speed higher than that of water.

30 22. An article of footwear as claimed in Claim 21 in which the soak-out material is or includes glycerin.

23. An article of footwear as claimed in Claim 20, Claim 21, or Claim 22 in which the soak-out material is contained in a closed, flexible container such as a pad or sachet.

5 24. An article of footwear as claimed in any one of Claim 20 to Claim 23 inclusive in which the soak-out material is provided in amongst granular or filamentary material having an acoustic speed higher than the acoustic speed of the soak-out material.

10 25. The combination of an article of footwear as claimed in any one of Claim 20 to Claim 24 inclusive, and a sock, in which the soak-out material is contained in the sock.